

WHAT IS CLAIMED IS:

1. A method for managing network traffic, comprising:  
provisioning an internet protocol (IP) network for communicating traffic, the  
IP network comprising a plurality of nodes coupled by IP links;  
5 monitoring the IP network for a congestion event;  
upon detecting a congestion event, selecting a label switched path (LSP) of the  
IP network for reroute;  
computing a hybrid path route for the selected LSP between a first node and a  
second node of the plurality of nodes, the hybrid path route comprising at least one  
10 lightpath of a wavelength division multiplex (WDM) topology coupled to the IP  
network;  
determining whether performance of the hybrid path route for the selected  
LSP reduces costs; and  
if the hybrid path route reduces costs:  
15 activating a new IP link on each of the at least one lightpaths of the  
WDM topology; and  
rerouting the selected LSP according to the hybrid path route.
2. The method of Claim 1, further comprising decommissioning an idle  
20 IP link after rerouting the selected LSP.
3. The method of Claim 1:  
further comprising receiving a transformed topology constructed by an optical  
transport service provider of the WDM topology, the transformed topology  
25 comprising a subset of available lightpaths of the WDM topology; and  
wherein the hybrid path is computed based on the transformed topology.
4. The method of Claim 1, wherein determining whether performance of  
the hybrid path route for the selected LSP reduces costs comprises accounting for a  
30 cost associated with each IP link and each lightpath of the hybrid path route.

5. The method of Claim 1, wherein activating a new IP link on each of the at least one lightpaths of the WDM topology comprises:

allocating an unused router port on each end of each of the at least one lightpaths; and

5 activating the allocated router ports with respective established lightpaths.

6. The method of Claim 1, wherein each of the plurality of nodes of the IP network comprises an IP router.

10 7. The method of Claim 1, wherein each of the lightpaths of the WDM topology couples optical crossconnects of the WDM topology.

8. The method of Claim 1, wherein the hybrid path route comprises at least one IP link.

9. A system for managing network traffic, comprising:
- an internet protocol (IP) network for communicating traffic, the IP network comprising a plurality of nodes coupled by IP links;
  - a wavelength division multiplex (WDM) topology coupled to the IP network,
  - 5 the WDM topology comprising a plurality of lightpaths operable to communicate optical traffic; and
  - a controller operable to:
    - provision the IP network for communicating traffic;
    - monitor the IP network for a congestion event;
    - 10 upon detecting a congestion event, select a label switched path (LSP) of the IP network for reroute;
    - compute a hybrid path route for the selected LSP between a first node and a second node of the plurality of nodes, the hybrid path route comprising at least one of the plurality of lightpaths of the WDM topology;
    - 15 determine whether performance of the hybrid path route for the selected LSP reduces costs; and
    - if the hybrid path route reduces costs:
      - activate a new IP link on each of the at least one lightpaths of
      - the plurality of lightpaths of the WDM topology; and
      - 20 reroute the selected LSP according to the hybrid path route.

10. The system of Claim 9, wherein the controller is further operable to decommission an idle IP link after rerouting the selected LSP.

- 25 11. The system of Claim 9, wherein:
- the controller is further operable to receive a transformed topology constructed by an optical transport service provider of the WDM topology, the transformed topology comprising a subset of available lightpaths of the WDM topology; and
  - wherein the hybrid path is computed based on the transformed topology.

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12. The system of Claim 9, wherein a controller operable to determine whether performance of the hybrid path route for the selected LSP reduces costs

comprises a controller operable to account for a cost associated with each IP link and each lightpath of the hybrid path route.

13. The system of Claim 9, wherein a controller operable to activate a new  
5 IP link on each of the at least one lightpaths of the plurality of lightpaths of the WDM topology comprises a controller operable to:

allocate an unused router port on each end of each of the at least one lightpaths; and

10 activate the allocated router ports with respective established lightpaths.

14. The system of Claim 9, wherein each of the plurality of nodes of the IP network comprises an IP router.

15 15. The system of Claim 9, wherein each of the plurality of lightpaths of the WDM topology couples optical crossconnects of the WDM topology.

16. The system of Claim 9, wherein the hybrid path route comprises at least one IP link.

17. Logic for managing network traffic, the logic encoded in media and operable when executed to:

provision an internet protocol (IP) network for communicating traffic, the IP network comprising a plurality of nodes coupled by IP links;

5 monitor the IP network for a congestion event;

upon detecting a congestion event, select a label switched path (LSP) of the IP network for reroute;

compute a hybrid path route for the selected LSP between a first node and a second node of the plurality of nodes, the hybrid path route comprising at least one  
10 lightpath of a wavelength division multiplex (WDM) topology coupled to the IP network;

determine whether performance of the hybrid path route for the selected LSP reduces costs; and

if the hybrid path route reduces costs:

15 activate a new IP link on each of the at least one lightpaths of the WDM topology; and

reroute the selected LSP according to the hybrid path route.

18. The logic of Claim 17, further operable when executed to  
20 decommission an idle IP link after rerouting the selected LSP.

19. The logic of Claim 17:

further operable when executed to receive a transformed topology constructed by an optical transport service provider of the WDM topology, the transformed  
25 topology comprising a subset of available lightpaths of the WDM topology; and

wherein the hybrid path is computed based on the transformed topology.

20. The logic of Claim 17, wherein logic operable when executed to determine whether performance of the hybrid path route for the selected LSP reduces  
30 costs comprises logic operable when executed to account for a cost associated with each IP link and each lightpath of the hybrid path route.

21. The logic of Claim 17, wherein logic operable when executed to activate a new IP link on each of the at least one lightpaths of the WDM topology comprises logic operable when executed to:

- 5 allocate an unused router port on each end of each of the at least one lightpaths; and  
activate the allocated router ports with respective established lightpaths.

22. The logic of Claim 17, wherein each of the plurality of nodes of the IP network comprises an IP router.

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23. The logic of Claim 17, wherein each of the lightpaths of the WDM topology couples optical crossconnects of the WDM topology.

24. The logic of Claim 17, wherein the hybrid path route comprises at least  
15 one IP link.

25. A system for managing network traffic, comprising:  
means for provisioning an internet protocol (IP) network for communicating  
traffic, the IP network comprising a plurality of nodes coupled by IP links;  
means for monitoring the IP network for a congestion event;  
5 means for, upon detecting a congestion event, selecting a label switched path  
(LSP) of the IP network for reroute;  
means for computing a hybrid path route for the selected LSP between a first  
node and a second node of the plurality of nodes, the hybrid path route comprising at  
least one IP link and at least one lightpath of a wavelength division multiplex (WDM)  
10 topology coupled to the IP network;  
means for determining whether performance of the hybrid path route for the  
selected LSP reduces costs; and  
if the hybrid path route reduces costs:  
means for activating a new IP link on each of the at least one lightpaths  
15 of the WDM topology; and  
means for rerouting the selected LSP according to the hybrid path  
route.

26. The system of Claim 25, further comprising means for  
20 decommissioning an idle IP link after rerouting the selected LSP.

27. The system of Claim 25:  
further comprising means for receiving a transformed topology constructed by  
an optical transport service provider of the WDM topology, the transformed topology  
25 comprising a subset of available lightpaths of the WDM topology; and  
wherein the hybrid path is computed based on the transformed topology.

28. The system of Claim 25, wherein means for determining whether  
performance of the hybrid path route for the selected LSP reduces costs comprises  
30 means for accounting for a cost associated with each IP link and each lightpath of the  
hybrid path route.

29. The system of Claim 25, wherein means for activating a new IP link on each of the at least one lightpaths of the WDM topology comprises:

means for allocating an unused router port on each end of each of the at least one lightpaths; and

5 means for activating the allocated router ports with respective established lightpaths.

30. The system of Claim 25, wherein each of the plurality of nodes of the IP network comprises an IP router.

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31. The method of Claim 25, wherein each of the lightpaths of the WDM topology couples optical crossconnects of the WDM topology.

32. The method of Claim 25, wherein the hybrid path route comprises at least one IP link.

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33. A method for managing network traffic, comprising:
- provisioning an internet protocol (IP) network for communicating traffic, the IP network comprising a plurality of nodes coupled by IP links, each of the plurality of nodes comprising an IP router;
- 5 monitoring the IP network for a congestion event;
- upon detecting a congestion event, selecting a label switched path (LSP) of the IP network for reroute;
- receiving a transformed topology constructed by an optical transport service provider of a wavelength division multiplex (WDM) topology, the transformed
- 10 topology comprising a subset of available lightpaths of the WDM topology, each lightpath of the WDM topology coupling optical crossconnects of the WDM topology;
- computing, based on the transformed topology, a hybrid path route for the selected LSP between a first node and a second node of the plurality of nodes, the
- 15 hybrid path route comprising at least one IP link and at least one lightpath of the WDM topology coupled to the IP network;
- determining whether performance of the hybrid path route for the selected LSP reduces costs;
- if the hybrid path route reduces costs:
- 20 activating a new IP link on each of the at least one lightpaths of the WDM topology; and
- rerouting the selected LSP according to the hybrid path route; and
- decommissioning an idle IP link after rerouting the selected LSP.